REMARKS

The office action of September 22, 2006, has been reviewed and its contents carefully noted. Reconsideration of this case, as amended, is requested. Claims 1-4, 12-38 and 47 remain in this case.

This response is filed to respond to the objections and rejections in the September 22, 2006, office action and to summarize the matters discussed in the October 26 and November 6, 2006, interviews and to supply the details requested by the Examiner and her Supervisor at the second interview.

Preliminary Comments

The numbered paragraphs below correspond to the numbered paragraphs in the Office Action.

a. The claims were amended as follows, per the suggestions of the Examiner in the November 6, 2006, interview to correct typographical errors and other informalities. No new matter was introduced. Specifically:

   a. Claims 1(a)(iv) and 15(a)(iv)(a)(4) were amended to change "the" result database to --a-- result database, to correct antecedent basis.

   b. Claims 2, 3 and 4 were amended to correct the reference to claim 1 from "(a)" to --(b)--.

   c. Claim 4 was also amended to correct a typographical error of section referred to as "(iiii)" (four "i"s), to the correct reference of --(iii)--.

   d. The term "depository" was corrected to --repository-- in claims 13 and 15.

Objection to the Specification

5. The disclosure was objected to on the grounds that the table referred to on page 8, line 11, was not displayed.

As pointed out at the November 6, 2006, interview, that table is present in the specification as filed, as page 9. Reconsideration and withdrawal of the objection is respectfully requested.

Objections to the Claims

6. Claims 13 and 15 were objected to because they recited the limitation "the repository", on the grounds that there is insufficient basis for the term.

The term "the depository" in Claims 13 and 15 was a typographical error - it has been corrected to --the **r**epository--. This refers to the term in the first line of claim 1 on which claim 13 depends - "A repository of material property data comprising..." and to claim 15 (a), first line "storing material property data in a repository...".

This corrects the antecedent basis problem. Reconsideration and withdrawal of the objection is respectfully requested.

Summary of Interviews and Explanation of Details

In the interviews of October 26th and November 6th, the structure of the invention was discussed. Specifically, the architecture of the present invention includes a test database, containing metadata and values, and a metadata database, which contains metadata about the metadata in the test database.

The following example explains Claim 1 which is stated below for reference.

1. (Currently Amended) A repository of material property data comprising a plurality of materials property datasets stored in a computer memory, each dataset being associated with a sample of a material and a test on the sample of the material, each dataset comprising:

a) a metadata database in the form of instances with associated metadata giving information about the instances, the metadata comprising at least one data element selected from a list comprising name, description, identifying information, data

type, units, acceptable values or ranges, and default value, the database comprising:

i) metadata on the material;

ii) metadata on the sample;

iii) metadata on the test;

iv) metadata on data value elements in a result database; and

b) a test result database comprising a plurality of instances having associated metadata in the metadata database giving information about the instance, the instances comprising information about at least one result derived from the test on the sample of the material, each instance comprising:

i) at least one data element identifying at least one of the material, the sample or the test; and

ii) at least one data value element selected from a list comprising a single data point, an equation, a graph, a data array, and a picture;

wherein the metadata in the metadata database define the instances in the metadata database and the instances of test result information in the test result database, and

wherein an instance from the test result database, combined with its associated metadata from the metadata database describes the test result derived from the test on the sample of the material.

Thus, it can be seen that the repository of the invention comprises two databases: a metadata database and a test results database. The metadata database is made up of metadata which describe or define the instances of the metadata database, which in turn are used to describe or define metadata which describe or define the instances of the results database. This was described in the interview as "metadata about metadata". The test results database consists of information on the material, sample and test which is represented by information (instances)

in the results database. The results database comprises information of different types - data points, equations, graphs, data arrays, pictures - all contained in the one database, with the metadata in the metadata database providing the necessary definition of the information so that the different types of data can be properly considered and displayed.

This data architecture, using metadata to describe metadata in the metadata database and also the results in the results database does not use the commonly held principle of one type of data = one table. Instead, it allows the extensibility needed to store highly varied material data without reconfiguring the database each time a new type of property needs to be added to the system.

Using the example of a dataset described in Table 1 from the specification, we will show how this information is stored in repository:

Table 1

Example of a Dataset Showing Metadata and Instances

Information Type	Metadata Type	Metadata (field name)	Instance Value	Description
	Property Dataset	Thermal Conductivity	None	
Owner Information	Owner	Name	Joe Smith	alphanumeric
		Company	ABC Industries	alphanumeric
Material Information	Material ID	Material Name	XYZ PP-2345	alphanumeric
		Material Class	Plastic	alphanumeric
		Material Sub-class	PP	alphanumeric
		Material Supplier	XYZ Polymers	alphanumeric
Sample Information	Sample Type	Type	Pellets	alphanumeric
	Sample ID	ID	1234-4556	alphanumeric
Test Information	Method	Test Method	ASTM D5930	alphanumeric
		Standard Body	ASTM	alphanumeric
	Parameters	Temperature	200	integer, °C

		Voltage	2.5	floating, Volts
		Drying	None	alphanumeric
	Source	Test Lab	HIJ Laboratories	alphanumeric
		Test Date	6/6/99	date
		Accreditation	ISO 9000	alphanumeric
Results	Result 1	Conductivity	0.2	Single Point, W/m.°K
	Result 2	Graph points	200, 0.2 190, 0.198 170, 0.195 150, 0.192 ...	Graph
	Result 3	Equation coefficients	3.1,0.44,-1.6	floating array
	Result 4	Picture	DSC0123.JPG	Picture file

For clarity in this explanation, some of the grid lines have been removed from column 1 as it was presented in the application, to more clearly indicate the groupings of rows (instances).

The entries in columns 3 and 4 of rows labeled Results in Column 1 and "Result 1"-"Result 4" in column 2 comprise data value elements that are described in Claim 1.b.ii, where the data value elements depicted in the table are a single data point, data array, equation and a picture respectively. Each data value element comprises the actual data value instance and a metadata identifier.

For example, to describe the instance of the Picture data value element, using Table 1, we would use "Picture" metadata identifier and the data value – "DSC0123.JPG".

The corresponding information about the " Picture" metadata indicated in column 5, such as the fact that it is an image file and that it has is in ".jpg" format are stored in the metadata database.

These data value elements are combined with one or more data elements (claim 1.b.i) that identify the material, the sample and the test, as identified by Material information, Sample

information, and Test information in column 1 of Table 1, further enumerated by the specific items identified in column 3 of Table 1, with the corresponding values from column 4. Together, columns 3 and 4 of the rows of Table 1 comprise the test result database of claim 1.b.

As an aside, to clarify a question raised by the examiner, the elements of the dataset are tied together using a unique identifier such as the Sample ID shown in Table 1 (see claim 1(b)(i) " at least one data element identifying at least one of the material, the sample or the test;").

Each data element comprises a metadata identifier and the actual data value. For example, to store an instance of test temperature, we would use "Temperature" metadata identifier and the data value "200". Information about the "Temperature" metadata such at the fact that it is an integer and that it has a unit of "C" plus limits of temperature, or a default value are stored in the metadata database.

Reorganizing the information presented in the dataset of Table 1, we can present the two databases in the repository, as described in the claims:

Metadata Database from Table 1

(claim 1.a)

Metadata col. 1	**Metadata about Metadata col. 2**
Name	alphanumeric
Company	alphanumeric
Material Name	alphanumeric
Material Class	alphanumeric
Material Sub-class	alphanumeric
Material Supplier	alphanumeric
Type	alphanumeric
ID	alphanumeric
Test Method	alphanumeric
Standard Body	alphanumeric

Temperature	integer, °C
Voltage	floating, Volts
Drying	alphanumeric
Test Lab	alphanumeric
Test Date	date
Accreditation	alphanumeric
Conductivity	Single Point, W/m.°K
Graph points	Graph
Equation coefficients	floating array
Picture	Picture file

In this graphic representation of the metadata database, each row is an instance (claim 1(a) " a metadata database in the form of instances...") representing (column 1) a type of metadata from the test results database ("wherein the metadata in the metadata database define ... the instances of test result information in the test result database,") and (column 2) metadata describing the characteristics of that metadata ("wherein the metadata in the metadata database define the instances in the metadata database...").

So, for example, instance 11 of the database has metadata "Temperature", described by the metadata "integer, °C" which give data type (integer number) and units (degrees Celsius) for that metadata. It would be recognized by one skilled in the art that for more complex types of data ("graph", for example), more complicated metadata would be required (i.e. axis values and titles, intervals, etc.), but this is just a simplified example to explain the database structure.

Test Result Database from Table 1

(claim 1.b)

Sample Col. 1	Metadata Col. 2	Data Value Element Col. 3
1234-4556	Name	Joe Smith
1234-4556	Company	ABC Industries
1234-4556	Material Name	XYZ PP-2345
1234-4556	Material Class	Plastic
1234-4556	Material Sub-class	PP
1234-4556	Material Supplier	XYZ Polymers
1234-4556	Type	Pellets
1234-4556	ID	1234-4556
1234-4556	Test Method	ASTM D5930
1234-4556	Standard Body	ASTM
1234-4556	Temperature	200
1234-4556	Voltage	2.5
1234-4556	Drying	None
1234-4556	Test Lab	HIJ Laboratories
1234-4556	Test Date	6/6/99
1234-4556	Accreditation	ISO 9000
1234-4556	Conductivity	0.2
1234-4556	Graph points	200, 0.2 190, 0.198 170, 0.195 150, 0.192 ...
1234-4556	Equation coefficients	3.1,0.44,-1.6
1234-4556	Picture	DSC0123.JPG

In this graphic representation of the test result database, each row is an instance (claim 1(b) " a test result database comprising a plurality of instances"). Each instance has a data element (column 1) identifying the instance, for this example chosen to be the Sample ID, but this could be some other identifier as determined by the designer (claim 1(b)(i) " at least one data element identifying at least one of the material, the sample or the test; ", and (column 2) metadata which corresponds to the metadata in the metadata database (claim 1(b) "...instances having associated metadata in the metadata database..."). Each instance also has (column 3) a data value (claim 1(b)(ii): " at least one data value element selected from a list comprising a single data point, an equation, a graph, a data array, and a picture;"). By referring back to the metadata database for a given metadata in an instance in this database, one can determine the characteristics of the data value element.

So, for example, instance 11 says that the sample ID is 1234-4556, this result is "temperature". Referring back to the metadata database, we find that "temperature" is an integer number, in units of degrees Celsius, so that we can then interpret the data value "200" as being an integer number representing the value 200°C.

The variety of data that can be stored in the test result database is augmented by adding metadata instances to the metadata database described in Claim 1.a.

For example, should we need to now store a previously unanticipated Test Information Parameter "thickness", we would add an instance of "thickness" metadata identifier and information about the "thickness" metadata (say, that it is a floating point number and that it has a unit of "mm" plus limits of thickness, or a default value as needed) to the metadata database:

Metadata col. 1	**Metadata about Metadata col. 2**
Name	alphanumeric
...	...
Picture	Picture file
Thickness	Floating, mm, limits 0.01-100.00, default 10.6

Once this is done, we now have a new data element "thickness" related to the thermal conductivity property for which we can add an instance in the test result database:

Sample Col. 1	Metadata Col. 2)	Data Value Element Col. 3
1234-4556	Name	Joe Smith
...	...	...
1234-4556	Picture	DSC0123.JPG
1234-4556	Thickness	12.34

This process is described in specification in Page 10, line 20 as:

> "Scalability of types of content is achieved by augmenting the metadata (17) to describe additional types of intrinsic property result information. Conversely, the metadata restricts the type of intrinsic property result information that can be submitted to the repository."

Rejection(s) under 35 U.S.C. §103

9. Claims 1-4 and 12-14 were rejected under 35 U.S.C. 103(a) as being unpatentable over Arrit in view of Cho.

It is true that the subject of the data that is being stored in the present invention and Arritt address the same field of endeavor - material test labs - the kind of supporting information being stored (such as information on material, sample and test) is by nature similar. That is where the similarity ends, however.

Arrit is an instrumentation information database which uses *a number of relational databases or tables* to store information about the utilization of test equipment. Arritt's application explicitly describes a *plurality of database tables*, and does not teach or suggest the use of a single results database with a separate associated metadata database. See paragraph [0010]: "...the present invention is a method for generating a compiled database comprising

creating a plurality of database tables; cross-linking the database tables; inputting requirements of the database tables; and collecting data for populating the database tables."

As discussed in the interviews, in Arritt, as in all prior art systems known to the Applicant, if it is desired to add a new type of data, one has to add a new table, whose fields are defined to accept that type of data, and to cross-link that table with the other tables.

Cho is a dissertation having a printed table with textual information. The table contains information of a single type - text. To the extent that Cho's table might be said to have metadata, the metadata is simply titles or headings in the same table.

A combination of Arritt and Cho would be a printed list of instrumentation utilization having labels and values on the list, or a computerized instrumentation information database which uses a database comprising a plurality of cross-linked tables to store information about the utilization of test equipment testing characteristics of crystals. Thus, Cho does not provide what Arritt lacks.

In contrast, the present invention uses a single database (table) to store the data about the results of the tests (the test results database), regardless of the format of the data, in the form of metadata and associated value(s). A second database (the metadata database) then describes the data in the test results database - "metadata on metadata" as it was described in the interview. This arrangement is not shown, taught or suggested in the prior art cited or known to the Applicant.

Reconsideration and withdrawal of the rejection are respectfully requested.

10. Claims 15-19, 21-26, 28-30, 34-38 and 47 were rejected over Arritt, Cho and Boyd (2003/0069795)

This rejection refers to the Claim 15 family of claims. Claim 15 is a method claim for using the repository of claim 1 (defined in claim element 15(a)). The arguments with respect to Arritt and Cho with regard to claim 1 are given above, and are repeated here by reference.

Boyd is a system for providing information on raw materials which uses a database 68, however no details of the organization of the database are given (other than it is searchable by a

raw material code). The detailed description lists a number of standard software products which can be used with the system. At no point does Boyd describe a two-database system as claimed in the present application, claim 15(a). Therefore, the combination of Arritt, Cho and Boyd would not teach or suggest the use of the novel metadata-on-metadata repository organization claimed in the present application.

Reconsideration and withdrawal of the rejection is respectfully requested.

11. Claim 20 was rejected under 35 U.S.C. 103(a) as being unpatentable over US PGPub 2005/0131861 to Arritt et al in view of US PGPub 2003/0069795 to Boyd et al as applied to claim 19 above, and further in view of US PGPub 2004/0243580 to Markki et al (hereafter Markki et al).

Claim 20 is dependent upon claims 19, 17, 16 and, finally, amended independent claim 15. The patentability of claims 15-19 over Arritt and Boyd was discussed above, which discussion is repeated here by reference, and claim 20 merely adds a further limitation to those claims (a specific computer protocol). Markki does disclose SOAP protocol, but Applicants are not claiming a standard computer protocol, as such, and Markki does not teach or discuss the repository structure required by amended claim 15. With claim 20 patentable over Arritt and Boyd for the reasons stated above, Markki does not add what Arritt and Boyd lack. Reconsideration and withdrawal of the rejection is respectfully requested.

12. Claims 27 and 31-33 were rejected under 35 U.S.C. 103(a) as being unpatentable over US PGPub 2005/0131861 to Arritt et al in view of US PGPub 200310069795 to Boyd et al as applied respectively to claims 26 and 15 above, and further in view of US Patent No 6,484,173 to O'Hare et al.

Claim 27 is dependent upon claim 26, which in turn depends on claim 15. Claims 31-33 also depend on claim 15. The patentability of claims 15 and 26 over Arritt and Boyd was discussed above, which discussion is repeated here by reference. O'Hare discloses control of access to a storage device, but does not teach or discuss the repository structure required by amended claim 15. With claims 15 and 26 patentable over Arritt and Boyd for the reasons stated

above, O'Hare does not add what Arritt and Boyd lack. Reconsideration and withdrawal of the rejection is respectfully requested.

Conclusion

Applicant believes the claims, as amended, are patentable over the prior art, and that this case is now in condition for allowance of all claims therein. Such action is thus respectfully requested. If the Examiner disagrees, or believes for any other reason that direct contact with Applicants' attorney would advance the prosecution of the case to finality, he is invited to telephone the undersigned at the number given below.

"Recognizing that Internet communications are not secured, I hereby authorize the PTO to communicate with me concerning any subject matter of this application by electronic mail. I understand that a copy of these communications will be made of record in the application file."

Respectfully Submitted:
Hubert Lobo

By: /mfb #29619/
Michael F. Brown, Reg. No. 29,619
Attorney for Applicant

BROWN & MICHAELS, P.C.
400 M&T Bank Building - 118 N. Tioga St.
Ithaca, NY 14850
(607) 256-2000 • (607) 256-3628 (fax)
e-mail: docket@bpmlegal.com
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